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PRE-APPEAL BRIEF REQUEST FOR REVIEW		Docket Number (Optional)																	
		23407-00001																	
I hereby certify that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to "Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450" [37 CFR 1.8(a)]  on _____  Signature _____  Typed or printed name _____	Application Number	Filed																	
	10/725,057	December 2, 2003																	
	First Named Inventor																		
	J. Edward CICHANOWICZ																		
	Art Unit	Examiner																	
	1754	Johnson, Edward M.																	
<p>Applicant requests review of the final rejection in the above-identified application. No amendments are being filed with this request.</p> <p>This request is being filed with a notice of appeal.</p> <p>The review is requested for the reason(s) stated on the attached sheet(s). Note: No more than five (5) pages may be provided.</p> <p>I am the</p> <table border="0"><tr><td><input type="checkbox"/> applicant/inventor.</td><td></td></tr><tr><td><input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)</td><td>Signature</td></tr><tr><td><input checked="" type="checkbox"/> attorney or agent of record.      34,794</td><td>Robert K. Carpenter</td></tr><tr><td>Registration number _____</td><td>Typed or printed name</td></tr><tr><td><input type="checkbox"/> attorney or agent acting under 37 CFR 1.34.</td><td>301-802-2668</td></tr><tr><td>Registration number if acting under 37 CFR 1.34 _____</td><td>Telephone number</td></tr><tr><td></td><td>June 30, 2006</td></tr><tr><td></td><td>Date</td></tr></table> <p>NOTE: Signatures of all the inventors or assignees of record of the entire interest or their representative(s) are required. Submit multiple forms if more than one signature is required, see below*.</p> <p><input type="checkbox"/> *Total of _____ forms are submitted.</p>				<input type="checkbox"/> applicant/inventor.		<input type="checkbox"/> assignee of record of the entire interest. See 37 CFR 3.71. Statement under 37 CFR 3.73(b) is enclosed. (Form PTO/SB/96)	Signature	<input checked="" type="checkbox"/> attorney or agent of record.      34,794	Robert K. Carpenter	Registration number _____	Typed or printed name	<input type="checkbox"/> attorney or agent acting under 37 CFR 1.34.	301-802-2668	Registration number if acting under 37 CFR 1.34 _____	Telephone number		June 30, 2006		Date
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	June 30, 2006																		
	Date																		

This collection of information is required by 35 U.S.C. 132. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.11, 1.14 and 41.6. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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In re the Application of

Confirmation No.: 2939

J. Edward CICHANOWICZ

Group Art Unit: 1754

Application No.: 10/725,057

Examiner: Edward M. Johnson

Filed: December 2, 2003

Attorney Docket. No.: 023407-00001

For: MULTI-STAGE HEAT ABSORBING REACTOR AND PROCESS FOR SCR OF  
NOX AND FOR OXIDATION OF ELEMENTAL MERCURY

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

June 30, 2006

Sir:

This is a pre-appeal brief request for review for the rejections contained in the Office Action dated January 31, 2006. Claims 1-25 are pending. Claims 1-14 and 23-25 stand withdrawn from consideration as being directed to a non-elected invention.

The Office Action rejected claims 15, 20 and 22 under 35 U.S.C. §102(b) as being anticipated by Hums (U.S. Patent No. 4,880,378). Applicant respectfully submits that this rejection should be withdrawn at least for the reasons discussed below.

Present claims 15-16 and 18-22 all require "introducing a reducing agent into a flue gas containing nitrogen oxides; then passing the flue gas through at least a first layer of nitrogen oxide reducing catalyst where an amount of nitrogen oxides in said flue gas is reduced; then passing the flue gas through a heat exchanger that removes heat

from the flue gas and the reducing agent; and then passing the flue gas through at least one additional layer of nitrogen oxide reducing catalyst where an additional amount of nitrogen oxides in the flue gas is reduced" (see claim, emphasis added).

The Office Action correctly asserts that Hums "discloses a method for NO<sub>x</sub> reduction in flue gas comprising injecting reducing agent, passing through a catalyst downstream of the injection, then passing through a heat exchanger, then passing through a second catalyst" (second paragraph in section #2 on page 2 of the Office Action). However, the present claims require a step that the heat exchanger "removes heat from the flue gas" (excerpt of claim 1, emphasis added). The removal – and not the addition – of heat is a basis of the inventiveness of the process, which exploits the effect of lower and not higher flue gas temperatures on the activity of the various types of catalysts described in the application.

In contrast, Hums requires exactly the opposite, namely that the "flue gases which have been mostly but not completely freed of nitrogen oxides are heated to above 700°C in the first heat exchanger downstream from the catalyst 37 for removing nitrogen oxides...before being directed to iron-nickel catalyst 39" (see Hums column 6, lines 14-20, emphasis added). Thus, Hums does not teach (or suggest) "passing [a] flue gas through a heat exchanger that removes heat from the flue gas and the reducing agent; and then passing the flue gas through at least one additional layer of nitrogen oxide reducing catalyst where an additional amount of nitrogen oxides in the flue gas is reduced" as required by the present claims. Although the flue gas is later cooled for desulfurization, no additional layer of nitrogen oxide reducing catalyst is

provided and no additional amount of nitrogen oxides in the flue gas is reduced, as required by the present claims.

Thus, as elements of the presently claimed invention are missing, it is submitted that Hums can not anticipate the presently claimed invention. Reconsideration and withdrawal of the 35 U.S.C. 102(b) rejection are respectfully requested.

The Office Action also rejected claims 16 and 18-19 under 35 U.S.C. §103(a) as being obvious over Hums and rejects claim 21 under 35 U.S.C. §103(a) as being obvious over Hums in view of Moller et al. (U.S. Patent No. 4,889,698). Applicant also submits that this rejection should be withdrawn for the reasons discussed below.

As mentioned above, Hums does not teach (or suggest) “passing [a] flue gas through a **heat exchanger that removes heat** from the flue gas and the reducing agent; and **then** passing the flue gas through at least one additional layer of nitrogen oxide reducing catalyst where an additional **amount of nitrogen oxides** in the flue gas **is reduced**” as required by the present claims.

Although the flue gas is later cooled for desulfurization, no additional layer of nitrogen oxide reducing catalyst is provided and no additional amount of nitrogen oxides in the flue gas is reduced, as required by the present claims.

Applicant notes that Hums employs a catalyst that does not selectively reduce NO to molecular nitrogen and water, but produces hydrogen as a byproduct, and a desulfurization process for SO<sub>2</sub> that does not participate in NO removal chemistry.

Applicant further notes that flue gas desulfurization (FGD) is a completely different process than selective catalytic reduction (SCR) NO<sub>x</sub> control, and there is no physical basis for NO<sub>x</sub> to be removed within a conventional or even advanced FGD

process. Sulfur dioxide (SO<sub>2</sub>) is relatively soluble, and is removed by solubilizing gas phase SO<sub>2</sub> into an aqueous-based or other liquid solution. The dissolved sulfite ion is then removed as a solid, by precipitation with an alkali (usually calcium), and production of a solid byproduct, such as calcium sulfate. Any heat exchanger preceding an FGD process is solely to minimize water consumption to prepare the aqueous-based alkali slurry, or in the case presented by Hums, to provide for reheat of water-saturated gas exiting the FGD process. (See column 5, lines 12-13.... "this reheating is required in order to maintain the draft needed in the chimney 19"). As nitrogen oxide (NO) is relatively insoluble, and is not removed within a conventional FGD process, nor is there even a feasible solid byproduct of reaction with NO that could be produced by an alkali, the presence of FGD is irrelevant to NO.

Regarding the air injected in Hums, air is injected not to cool flue gas, but to provide an oxidizing media and assure that any hydrogen generated by the special-purpose nickel-iron catalyst (not contemplated by the present invention) is consumed. Also, this air acts to increase and not decrease temperature, through a combustion reaction. (See column 6, line 45..... "the air directed into the combustion chamber 40 immediately burns with the remaining hydrogen and heats the flue gases".) Moller et al., which is cited to show contacting with activated carbon to remove mercury, fails to make up for the deficiencies of Hums. The use of activated carbon to remove mercury is unrelated to the invention of present claim 21, which is directed to exploiting the SCR process to oxidize mercury and thus enhance its subsequent removal. In particular, Moller et al. fails to teach (or suggest) "passing [a] flue gas through a heat exchanger that removes heat from the flue gas and the reducing agent; and then passing the flue

gas through at least one additional layer of nitrogen oxide reducing catalyst where an additional amount of nitrogen oxides in the flue gas is reduced"as required by the present claims.

Thus, as elements of the presently claimed invention are missing from both Hums and Moller et al., it is submitted that the presently claimed invention would not have been obvious over the combination of the teachings of these two references.

Furthermore, Applicant notes that Hums specifically teaches against using a heat exchanger to remove heat prior to removing nitrogen oxides in a nitrogen oxides reducing catalyst, by requiring that the flue gases are heated in a heat exchanger prior to removing the nitrogen oxides in a nitrogen oxides reducing catalyst.

Thus, this teaching against the presently claimed invention in Hums even further demonstrates the nonobviousness of the presently claimed invention. In view of the above, it is respectfully submitted that the present claims also would not have been obvious over the combination of the applied references. Therefore, reconsideration and withdrawal of the rejections under 35 U.S.C. 102(b) and 35 U.S.C. 103(a) are respectfully requested.

Respectfully submitted,

A handwritten signature in black ink, reading "Robert K. Carpenter", written over a horizontal line.

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